

AMENDMENTS TO THE SPECIFICATION AND ABSTRACT:

Please replace paragraph [0002] of the substitute specification with the following paragraph:

C1 [0002] International Application PCT/JP 98/03544 filed August 10, 1998 (International Publication WO99/07641) discloses hydrothermal electrolytic processes and apparatus previously developed. According to these processes and apparatus, ~~reducible~~ reducing substances such as organics (including synthetic polymers) or ammonia can be effectively oxidatively degraded by performing hydrothermal reaction and electrolysis at the same time. When an oxidizer or strong acid ions such as halide ions are contained in an influent, hydrogen emission can be inhibited during hydrothermal electrolysis. The disclosure of International Application PCT/JP 98/03544 is incorporated herein in its entirety.

Please replace paragraph [0008] of the substitute specification with the following paragraph:

C2 [0008] An aspect of the present invention provides a hydrothermal electrolytic apparatus comprising a reaction cell for electrolyzing an influent containing water and ~~reducible~~ reducing substances at high temperature and high pressure, wherein the reaction cell defines a chamber and has a pair of electrodes and an overall surface area of the pair of electrodes exposed in the chamber per 1 m³ of volume of the chamber in the reaction cell is 0.05 m² or more.

Please replace paragraph [0013] of the substitute specification with the following paragraph:

C3 [0013] Another aspect of the present invention provides a process for preparing clarified water, comprising the steps of introducing an influent containing water and ~~reducible~~ reducing substances into a reaction cell of a hydrothermal electrolytic apparatus, supplying a direct current into the reaction cell at a temperature of between 100°C and a critical temperature of the influent and at a pressure that allows water in the influent to be maintained in a liquid phase, and discharging an effluent from the reaction cell. This clarified water may be recycled to another process or discharged to an environment.

Please replace paragraph [0051] of the substitute specification with the following paragraph:

C4 [0051] An influent is heated up to a sub-critical temperature and then introduced via inlet 21. At the same time, an oxidizer such as oxygen-dissolved water is introduced via oxidizer inlet 22 and mixed with the influent in mixing chamber 23. The influent mixed with the oxidizer is forced upwardly under pressure of successively introduced influent and oxidizer and inserted into reaction cells 31 via lower openings 31b of the reaction cells. The influent introduced into reaction cells 31 is subjected to hydrothermal reaction and electrolytic oxidation reaction as it moves through chambers 7 so that ~~reducible~~ reducing substances in the influent are degraded. Treated influent is introduced into discharge channel 8 via upper openings 31c and discharged from outlet 34. Effluent, after treatment, is introduced into various tanks as in known processes. In the apparatus according to this embodiment, a series of these reaction processes can be continuously performed.

Please replace paragraph [0062] of the substitute specification with the following paragraph:

C5 [0062] In the apparatus according to this embodiment, influent is introduced from inlet 21 and transferred to a top of the reaction vessel through pipe 26, then transferred from the top to a bottom of the reaction vessel through an outer channel, then transferred from the bottom to the top in a subsequent outer channel, and so on. Thus, influent is transferred successively from the center to the periphery of the reaction vessel. During this transfer, ~~reducible~~ reducing substances in the influent are oxidatively degraded by hydrothermal electrolysis. Treated influent is discharged from outlet 34 to an exterior of the reaction vessel.

Please replace paragraph [0073] of the substitute specification with the following paragraph:

C6 [0073] In hydrothermal electrolytic apparatus and processes of the present invention, an influent containing water and ~~reducible~~ reducing substances can be treated to oxidatively degrade the ~~reducible~~ reducing substances. Influents that can be treated by the present invention include various waste liquors. ~~Reducible~~ Reducing substances that can be degraded by the present invention include organics and ammonia. Examples of organics include aliphatic and aromatic hydrocarbons such as alkanes, alkenes, alkynes; alcohols; aldehydes; ketones; amines; carboxylic acids such as acetic acid;

carboxylic acid derivatives such as esters, amides, anhydrides; halogenated hydrocarbons; phenols; sulfur-containing organic compounds such as sulfoxides, mercaptans, thiols, polysulfones; and the like. Organics also include synthetic polymers such as polyolefins, polyesters or various engineering plastics.

Please replace paragraph [0074] of the substitute specification with the following paragraph:

C6
[0074] Influents preferably have fluidity, and may be any of suspension, emulsion, aqueous solution or slurry, but preferably suspension or slurry. Influents may contain liquid or solid ~~reducible~~ reducing substances. Influents include suspensions of unprecipitable solid particles dispersed in water, emulsions of liquid particles dispersed in water, aqueous solutions of liquid organics or inorganic dissolved in water and mixtures thereof. For example, influents contain a continuous phase containing water, liquid organics and dissolved salts and a discontinuous phase containing solid organics such as particles, and optionally non-combustible solids such as ash.

C7
Please replace paragraph [0082] of the substitute specification with the following paragraph:

[0082] Feed tank 61 can be connected to high-pressure pump 66 via line 64 to transfer an influent. A tap water line 68 for supplying tap water is preferably connected to line 64 so that tap water, substantially free from ~~reducible~~ reducing substances, can be transiently flowed when the hydrothermal electrolytic apparatus shown in Fig. 13 is started up or stopped.

C8
Please replace paragraph [0085] of the substitute specification with the following paragraph:

[0085] Preferably, influent line 60 has heater 74 for further heating influent heated by heat exchanger 70. Especially when reaction vessel 1 has a large diameter, it is inefficient to heat influent in reaction vessel 1 from an exterior of reaction vessel 1, and it is thus preferable to provide heater 74 in the influent line. Heater 74 heats the influent to a temperature required for hydrothermal reaction, for example. A temperature to which the influent is heated is determined taking into account exothermic heat from an oxidation reaction, and exothermic heat from electrolysis of ~~reducible~~ reducing

C8 substances in reaction vessel 1. Another heater for heating an exterior of reaction vessel 1 may also be provided.

C9 *Please replace paragraph [0101] of the substitute specification with the following paragraph:*

[0101] A reaction time should be enough long for ~~reducible~~ reducing substances in the influent to be oxidatively degraded, for example 1 second to 48 hours, preferably 1 minute to 24 hours. The reaction time is more preferably 5 hours or less, still more preferably 2 hours or less. The reaction time is adjusted as a function of volume of reaction vessel 1 and feed flow rate of the influent.

C10 *Please replace paragraph [0111] of the substitute specification with the following paragraph:*

[0111] Still another aspect of the present invention provides a hydrothermal electrolytic apparatus comprising a feeder for supplying an influent containing water and ~~reducible~~ reducing substances with conductive particles, and a reaction cell for subjecting the influent supplied with the conductive particles to electrolysis at a temperature of between 100°C and a critical temperature of the influent and at a pressure that allows water in the influent to be maintained in a liquid phase. In the apparatus, the reaction cell preferably has a pair of electrodes, more preferably one of which serves as an anode and the other of which serves as a cathode.

Please replace paragraph [0112] of the substitute specification with the following paragraph:

[0112] Still another aspect of the present invention provides a hydrothermal electrolytic apparatus comprising a reaction cell for supplying a direct current to an influent containing water, ~~reducible~~ reducing substances and conductive particles at a temperature of between 100°C and a critical temperature of the influent and at a pressure that allows water in the influent to be maintained in a liquid phase, and a separator for separating the conductive particles from an effluent. Preferably, the reaction cell has a pair of electrodes, more preferably one of which serves as an anode and the other of which serves as a cathode.
